
Florida Harbor Pilots Association photo

Pilotage is not for the faint-hearted. Embarking and disembarking ships at all hours and in all weather conditions is dangerous work. Eight pilots have died on the job in the United States in the past 14 years.

# Piloting, still an exclusive maritime club, hones an educational track

by Alan R. Earls

Pilots represent a small fraction of U.S. mariners, but their impact — safely guiding up to 90 percent of goods into the nation's ports — is immense. While experience remains the most valuable component of pilotage, training has evolved to assume a larger role in developing successful careers.

What does it take to become a pilot? The central feature of pilotage regulation in the U.S., including licensing, is that states, not the federal government, call the shots, according to Clayton Diamond, executive director and general counsel of the American Pilots' Association (APA). He explained that the Lighthouse Act of 1789 put this system in place and that the states' role has been reaffirmed and strengthened by both Congress and courts over the years.

In one case, the Supreme Court stated that there was "no doubt of the superior fitness and propriety, not to say the absolute necessity, of different systems of regulation, drawn from local knowledge and experience, and conformed to local wants." That's why, Diamond said, the U.S. system is principally a state system, with states being primarily responsible for oversight of both pilotage and licensing of pilots.

"Each coastal state has taken the authority granted by Congress to regulate pilotage and fashioned a comprehensive licensing system tailored to the local conditions and navigational demands of its waters," he said.

### The evolution of training

Although traditionally based on apprenticeship, advances in technology over the years have given pilots "new ways to supplement their training and also provided

pilots additional tools to use in carrying out their pilotage duties," said Capt. Jorge Viso, president of the APA. Viso, former chairman of the APA's Navigation and Technology Committee, noted that pilots have been active participants in the development, improvement and use of continually evolving navigational technology.

"Pilots are committed to staying in the forefront of advanced navigation technologies, which is why (they) routinely work with portable pilot unit (PPU) suppliers to update and adapt the units to best suit the needs and demands of a particular port, waterway or pilotage route," he said.

Given their "unparalleled knowledge" of the waters on which they operate, however, pilots are not wholly reliant on technology to safely carry out their duties, Diamond said. "Pilots will always use all means available to them, including traditional visual piloting techniques and existing aids to navigation, but navigational technologies are certainly important tools at pilots' disposal," he said.

To get the most out of these technological advances, training providers have become a growing part of the safety equation.

Adam Burkley is maritime director at the Maritime Pilots Institute in Covington, La., which serves pilots from a wide geographic area, including those working on the St. Lawrence Seaway. One of MPI's claims to fame is a virtual simulator supplemented by 1/25-scale manned models, "so that you can have a chance to apply the lessons from the simulator in a kind of real-world environment afloat," he said.

Burkley, a retired Coast Guard commander who is a training coordinator at the school, said the real possibility of collisions and other mishaps in an actual vessel — even at the smaller scale — helps make the learning stick. The results of the training are personally satisfying, especially with the new ultra-large containerships. Ranging up to 1,200 feet long with a beam of about 160 feet, "it can be really impressive to see a pilot bring a vessel into berth," Burkley said.

In addition to ship-handling training, MPI offers classes ranging from cybersecurity to the legal aspects of piloting, he said.

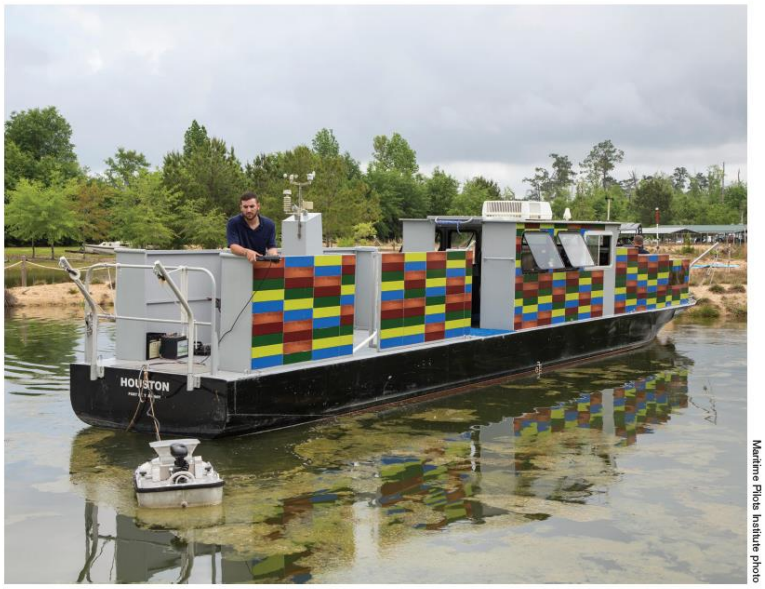
Capt. Jon Kjaerulff, director of business development at MITAGS-West (formerly the Pacific Maritime Institute) in Seattle, said his organization also was involved in the early stages of creating realistic simulations. And the technology has only improved with time.

"Now, we can put you in a harbor and it looks and feels real — even the hydrodynamic characteristics are accurate to the point where we can simulate specific vessels," he said. "Cruise lines come to us to find out how their vessels will handle in a particular waterway."

Simulations also can be used to test and rehearse tugboat combinations for maneuvering large vessels. "If it works in the simulator, it generally works exactly the

Malta Maritime Pilots photo

**Advanced simulation technology can take a pilot to a specific harbor and mimic specific conditions, replicating the characteristics and handling of a wide range of vessels in the process.**




Maritime Pilots Institute photo

The curriculum at the Maritime Pilots Institute in Covington, La., includes real-world lessons with manned ship models. *M/M Houston*, a 1/25-scale neo-Panamax containership, was commissioned by the Houston Pilots as a research training vessel.

same way when it is done on the water," Kjaerulff said.

Until 10 or 15 years ago, pilot organizations recruited individuals who had solid maritime experience, then had them spend time riding along with skilled pilots, he said. If they were eventually accepted into the organization, they would be given more formal pilot training. Now, training and simulation allow for the selection of better candidates.

"We can put them in a simulated real-life scenario and see how they respond," Kjaerulff said. Most West Coast piloting organizations use that approach today, he said, and follow up with additional training for selected candidates.

Nationally, Diamond said, pilots routinely receive instruction on advanced bridge simulators and precisely scaled manned models to supplement both initial and recertification training. Marine casualty case studies, a common and effective part of pilot classroom work, also have been enhanced through technology. The advances allow easy voyage data recorder (VDR) and automatic identification system (AIS) playback of navigation and communications aspects of actual accidents.

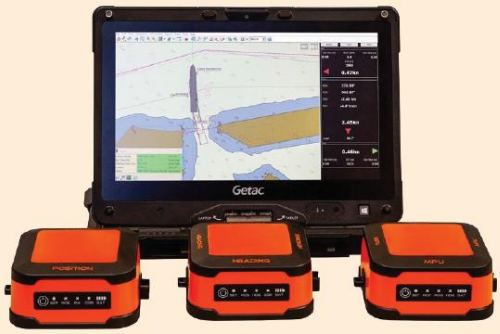
Diamond said all states still require a formal apprenticeship program as the basis to certify candidates for eventual licensure. The length of a program can range from one to three years for a mariner with an advanced credential to seven years for an applicant with less maritime experience. Future pilots learn their craft under the tutelage of fully licensed and experienced pilots.

Pilots must be intimately familiar with the navigational peculiarities and regulations of local waters. They also must know how to handle different


Florida Harbor Pilots Association photo

A pilot has the conn as ships pass off the coast of Florida. Despite advances in virtual training, all states still require a formal apprenticeship program before pilots can earn a license.

## Technology in a backpack: PPUs modernize piloting




Development of the portable pilot unit (PPU) in the United States began in 1980 through the efforts of the U.S. Coast Guard Research and Development Center, the Johns Hopkins Applied Physics Laboratory, and Capt. Joseph Bradley of The Pilots' Association for the Bay and River Delaware.

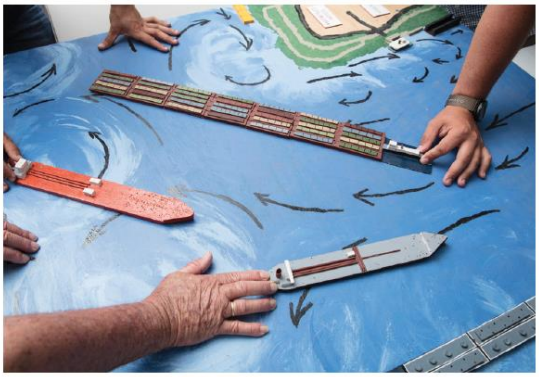
But the electronics of the day and the limits of LORAN-C radio navigation systems made them bulky and limited their accuracy to about 30 feet. When GPS was opened to civilian use in the 1990s, the story changed. Two private entities, Starlink Inc. and Raytheon Service Co., joined Bradley in the project with the goal of turning the PPU into a commercially viable product.

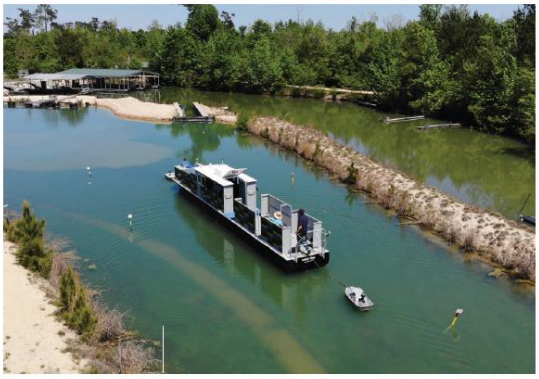
**Modern PPUs are composed of sensors and a laptop computer (or tablet) typically carried aboard in a backpack. The sensors are placed outside on the ship and the pilot uses the real-time data to improve navigational accuracy.**

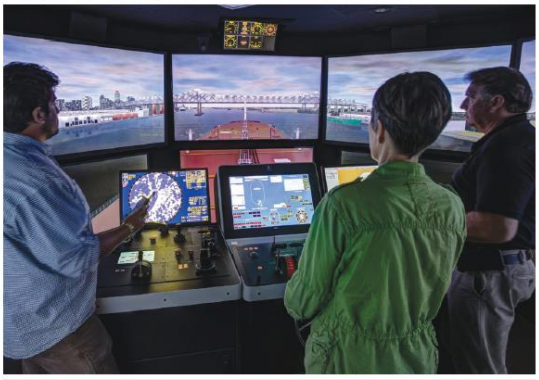
In 1994, The Pilots' Association for the Bay and River Delaware became the first U.S.-based pilotage group to equip all of its pilots with PPUs. In the 25 years that have followed, virtually all U.S. pilot groups have equipped their members with PPUs supplied by a number of commercial vendors.

*Clayton Diamond, American Pilots' Association*









types of ships and be able to conduct themselves suitably with bridge teams from all over the world. Thus, Diamond noted, an intensive "on the job" training program is vital.

"Time has shown that the skills required of a pilot are best developed, and then mastered, through locality-specific 'hands-on' apprentice training," he said.

After completing an initial apprenticeship, a pilot commission may issue an individual a deputy pilot license or a class of license that authorizes the person to pilot vessels only up to a certain draft, length or tonnage, Diamond said. State commissions typically authorize numerous pilot license classes, with the lowest level for the smallest vessels calling at a particular port and the highest level (i.e., a full pilot license) for the largest ships. It can take several years, in addition to the years spent in an apprenticeship program, to attain a full pilot license.

**Not a profession for everyone**

In addition to being a potentially stressful occupation, piloting also can be dangerous. The physical risks to pilots are serious, Diamond said, as the job involves embarking and disembarking large ships on rope ladders at all times of day and night and in all types of sea states and weather. In the United States, eight pilots have been killed in the line of duty in the past 14 years, and on average at least one pilot is killed each year while engaged in operations globally.

"While the important work pilots do every day may not make the front pages, it does make a difference," Viso said. "These men and women do a remarkable job of protecting the safety of navigation and marine environment while keeping vital maritime commerce flowing." •